

American Neurological Association.

FIFTH ANNUAL MEETING.

WEDNESDAY, JUNE 18TH—FIRST DAY—AFTERNOON SESSION.

The Association was called to order at 3 p. m., by the Secretary, Dr. E. C. Seguin, of New York, who introduced the President, Dr. F. T. Miles, of Baltimore, Md.

Present—Drs. Beard, Edes, Gray, Hammond, McBride, Mason, Miles, Putnam, Rockwell, Schmidt, Seguin, Shaw and Spitzka.

The President thanked the Association for the honor it had conferred upon him in his absence, and proceeded with the regular order of business.

On recommendation of the Council, the resignations of the following gentlemen were accepted: Dr. A. McLane Hamilton, Dr. D. B. St. John Roosa, and Dr. E. G. Loring, of New York; and Dr. Swan M. Burnett, of Washington, D. C.

The Treasurer's report was read and approved.

CANDIDATES FOR MEMBERSHIP.

Dr. William A. Hammond nominated Dr. W. J. Morton, of New York; and Dr. E. C. Seguin nominated Dr. R. W. Amidon, of New York, for membership in the Association.

The essays of the candidates were referred to the Council for examination and report.

The following amendment, proposed at the last annual meeting, was unanimously adopted:

“ART. VIII. All matters of business shall be attended to by the Council subject to the revision and approval of the Association.”

After a discussion by Drs. Mason, Hammond, Gray and others, the following amendment to Art. 8 of the By-Laws was proposed:

“8. Any member of the Association absenting himself from two consecutive meetings of the Association shall cease to be a

member, unless what the Council may deem a suitable excuse shall be presented."

GUNSHOT WOUND OF THE NECK—PARALYSIS OF THE CERVICAL
SYMPATHETIC, FOLLOWED BY INSANITY,

was the title of a paper sent by Dr. H. M. Bannister, of Chicago, Ill., and read by the Secretary.

The peculiarity of the case reported was, that it exhibited an apparent consequence of these injuries which had not been heretofore reported. The ball from a revolver entered upon the left side of the neck between two and three inches above the clavicular origin of the sterno-cleido-mastoid muscle, directly upon its anterior or inner margin, and, passing backward and a little downward, was lost in the tissues.

The leading symptoms were exophthalmos of the right eye or enophthalmos of the left eye; inequality of the pupils, the right being the largest; and a difference of 1° C. in the temperature of the two sides of the face. There was no tenderness upon pressure on any part of the neck, no ptosis, and no history of any lesion of important nerves save the sympathetic. It was as nearly a case of uncomplicated injury to the cervical sympathetic as he had seen recorded. The chief feature of interest was the connection the case had with mental disorder. There was no history of special neurotic tendency or symptoms of mental disorder antedating the reception of the wound, and no known cause of the insanity, except the wound. He had delusions, hallucinations, and occasionally signs of paralysis. The patient believed himself to be the bishop of Chicago, and thought he had power to make people tell their secrets.

Dr. William A. Hammond, of New York, remarked that Dr. Bannister had barely glanced at the most important part of his case. He had alluded to the fact that the man had *délire des grandeurs*, but had avoided altogether association of disease of the sympathetic nerve with the general paralysis of the insane. He was astonished that so good a scholar as Dr. Bannister should pass so lightly over such an important point. Lesion of the sympathetic existed in most, if not all cases of general paralysis of the insane. In this case, whatever brain lesion there was must have been secondary to the injury of the sym-

pathetic, and, therefore, possibly originated in the latter. The case also went to confirm the opinion that the mind, whatever it was, existed in grey nervous matter wherever found, as well as in the brain itself.

Dr. E. C. Seguin, of New York, remarked that before accepting the case as one of general paralysis of the insane, it would be desirable to scan the semeiology. The only symptom alluded to in the report that would lead to that supposition was the *délire des grandeurs*. Dr. Bannister had not mentioned fibrillary movements of the muscles, peculiar speech, epileptiform attacks, or other varieties of ambitious notions, and simply stated that at one time the patient supposed he was bishop of Chicago, and that he also had power to make people reveal their secrets. But, leaving aside the psychical symptoms, Dr. Bannister had not mentioned the physical symptoms, which were never absent in general paralysis of the insane. He could admit that there was chronic cerebral hyperæmia simply, but should be reluctant to classify the case with general paralysis of the insane.

Dr. Hammond remarked, he was the first to call attention to the fact that, in general paralysis of the insane, physical symptoms manifested themselves before mental symptoms were developed. He had been told by a number of superintendents of insane asylums that they had never, or rarely, if ever, at least, seen a case of general paralysis of the insane in its earliest stages. Consequently, those who had written upon the subject really knew nothing about the primary symptoms, which were physical.

Dr. Putnam, of Boston, objected to the admission of the evidence regarding the patient's psychical condition, and could not see why this injury, situated in an important nerve tract, should act in any other way than through peripheral disorders.

Dr. J. J. Putnam showed a convenient form of German-silver wire *rheostat*, of which the chief merit was that it was cheaper than most instruments of this kind, for the reason that the resistances of the coils had been determined only roughly. Dr. P. claimed that great accuracy is utterly superfluous in such apparatus for clinical work, especially when suitable gal-

vanometers (with a scale indicating absolute quantities of electricity, in Weber's) are used to control the strength of the current.

Dr. Putnam also spoke briefly of the relative advantages of *high and low tension batteries* for clinical work. It had been claimed by a recent writer that the current from the former makes its way more directly through the tissues, between the electrodes, than that from the latter. Experiment, as well as theory, shows this to be an error. It is only when "disruptive" currents are used that the passage of electricity through any conductor fails to obey Ohm's law. The only advantage of high tension batteries (large number of cells, of high resistance) over those of low tension, lies, firstly, in the fact that it is easier to make them durable and constant; secondly, that the strength of the current is affected to a far less degree, with them, by the drying of the electrodes during an application, or by the interposition of a thicker layer of epidermis, or by diminishing the size of the electrodes. This makes it easier to compare the strength of applications made on different days, or to different parts of the body, etc. For ordinary clinical work, however, it is on the whole better to use a battery of which the internal resistance does not greatly exceed that of the human body.

It is then possible to enlarge the electrodes to a convenient size, with the effect of increasing the total quantity of electricity passing, without diminishing its density at any given point; whereas, with high tension and high resistance batteries, an enlargement of the electrodes does not materially increase the total quantity of electricity passing, but does diffuse it through a broader surface of skin, thus diminishing its local action, as for example on a special nerve trunk.

Dr. Hammond, of New York, remarked that rheostats were really of no value whatever in the practice of medicine. The only practical apparatus was something which enabled us to bring a greater or smaller number of cells into the circuit at the same time, and then some temporary arrangement for making and breaking the circuit.

Dr. Putnam allowed all that Dr. Hammond said was true; but the apparatus presented simply permitted of gradual in-

crease in the intensity of the current, and small batteries lasted longer when all the cells were used than when only a part were employed.

Dr. Beard, of New York, remarked that at one time he experimented with all forms of rheostats, but after a while he got out of the way of using any. He thought that his experience was not at all exceptional. Theoretically, they sounded well, and appeared well when written out in full detail; but his experience had been that they possessed no special practical value. For him, pressure of the sponge made a very good rheostat.

Dr. Rockwell.—The method alluded to by Dr. Beard, as practically a good substitute for the rheostat, of increasing or decreasing the pressure upon the sponge electrode, answers very well in many cases where no especial delicacy of manipulation is called for. In other cases, however, it would be an exceedingly slipshod method of procedure, and by it we should certainly fail to obtain the best results possible. In many irritable conditions it is extremely important that the current should be absolutely without break or variation, and these cannot in the strictest sense be secured without the aid of some form of rheostat. Most galvanic batteries that are now constructed, have an arrangement by which it is claimed that the number of working elements may be increased without interrupting the current. My own experience will not substantiate this statement. Even with the greatest precision of manipulation, breaks are apt to occur when least expected or desired, and it is far safer, therefore, to be always provided with some form of rheostat.

Dr. Miles, of Baltimore, remarked that he used the water rheostat constantly, and found it a very great convenience, especially when using electricity on children.

Dr. Seguin remarked that with any of the various sliding bars or dial-shaped current selectors on galvanic batteries it was next to impossible to avoid shocks to the patient, especially the very annoying opening shocks at the close of an application. None of these apparatuses worked exactly in his experience. He thought the chief advantage of a rheostat was the ability it gave to commence with a large number of cells, and

gradually increase the current until sufficient sensation was produced—the sensation of the patient being the guide. An objection to the water rheostat was, that while it answered very well up to a certain point, where the metallic points were within a short distance of each other, it was almost impossible to bring them nearer without bringing them together, and thus give rise to a shock. The attachment of a micrometer screw and guard would be advantageous.

Dr. Mason.—I have never used the instrument in therapeutics except on the eye and ear at the N. Y. Infirmary. The whole matter of electro-therapeutics is, and will probably for a long time remain, a physiological one. Hence the importance of all new acquisitions like Dr. Putnam's instrument. For obtaining very mild currents of course it is superior to the water rheostat, when attached as an accessory circuit.

The Association then adjourned, to meet at 8.30 P. M.

FIRST DAY.—EVENING SESSION.

Present: Drs. Beard, Edes, Gibney, Kinnicutt, Mason, Miles, Putnam, Rockwell, Seguin and Spitzka.

The Society being called to order by the President, a paper was read by Dr. George M. Beard, of New York, on

MORBID FEAR AS A SYMPTOM OF NERVOUS DISEASE.

The emotion of fear might be a normal one, varying in degree and kind with race, sex, and individual. It might also be a truly pathological symptom, evidencing in such case disorder of the nervous system. Normal and morbid fears might shade into each other, so that it was difficult to draw the line between them.

These morbid fears might be classified and named for convenience of study, and for the purpose of preventing their confusion with hysteria, hypochondria, dyspepsia, and actual insanity, to which conditions they were often referred. There were quite a number of morbid fears associated with neurasthenia without delusions or hallucinations.

The following classification might be given:

Astraphobia (first described by Dr. Beard a number of years

ago), in which there was great fear of lightning during and before thunder-storms, that fear being preceded and accompanied by headache, numbness, pain in the back, nausea, vomiting, and even convulsions. In one of his patients suffering from that symptom, the condition was inherited from the grandmother.

Agoraphobia was a name given by Westphal, of Germany, to those having a fear of places. The term was not an accurate one, and *topophobia* should be used in its stead, *agoraphobia* being only a species of *topophobia*, and embracing those cases in which there was a fear of open squares. As an illustration of *topophobia*, one of his patients could walk up Broadway without fear or difficulty, on account of the numerous stores and side-streets, into which he knew he could run, in case of supposed danger presenting itself; but he could not walk up Fifth Avenue; he could not visit the country at all. He was a tall, vigorous man, and had no other symptoms of cerebral disturbance. The cases often took an opposite phase: the patients were unable to go to certain places; perhaps where they were first attacked with the evil symptoms. Some found it difficult to go on long journeys. A patient in a distant city wrote that he was coming to visit him, but after getting part of the way he had to return. Some persons had a fear of confined places. A gentleman suffering thus was obliged to camp out in the summer and sleep in a very large room in winter. He finally had to leave the city and become a farmer.

Anthropophobia, that Dr. Beard had lately described, had for its symptoms an aversion to society; fear of seeing any one; sometimes there was fear of women alone; sometimes, as in one of his patients, fear of respectable women alone.

Pathophobia, or fear of disease, was generally known under the name of hypochondriasis. Photophobia was a term that might be applied to some patients who feared that they might fail if they made an attempt to do anything.

Mysophobia, or fear of contamination, had lately been described by Dr. Hammond.

In regard to all these different forms of fear, the following general propositions were made:

1st. They were symptomatic of functional, rarely or never

of organic, disease. They were not, according to his experience, found in insanity or sclerotic conditions, and were no form of that disease. The morbid fears of the insane were delusions or hallucinations.

2d. The symptoms might come and go suddenly.

3d. They often were the result of disorders of the reproductive organs in male and female, but might continue long after such disorder had been cured.

4th. They rarely existed alone, but almost always were associated with other symptoms of disorder of the spinal cord or brain, especially of the brain. Among those symptoms were palmar hyperidrosis, dizziness, numbness, shooting pains in the extremities, oxaluria, etc. All those symptoms were by no means uniformly present. The patients might be of great muscular development, and capable of great bodily toil. The treatment required both constitutional and local measures. The former included the whole array of sedatives and tonics; electricity, bromides, counter-irritation at the back of the neck, and counter-irritation of the bowels by means of cathartics. The local troubles should be appropriately treated. The cases could be permanently cured, but not in any short time.

Dr. J. J. Putnam, of Boston, asked if the vertigo ever occurred without being excited or accompanied by any motor idea or intention.

Dr. Beard thought that it did.

Dr. J. J. Mason, of New York, referred to the very common occurrence of fear of lightning and storms, especially with women, and asked why this should be distinguished as a special morbid symptom.

Dr. Beard said that in the cases given there was much more than ordinary fear. The patients often suffered from nausea, vomiting, dizziness, and even convulsions.

Dr. A. D. Rockwell, of New York, said that, without being able to give any special examples to the contrary, he nevertheless could not accept the statement that these fears were always the result of functional, rather than organic derangement.

Dr. Beard, in reply, said that it was his experience that the facts were as he stated.

Dr. E. C. Seguin, of New York, remarked that while the minute study of a symptom of this class was very interesting, it was hardly profitable in practice. He had always found numerous other symptoms with those described by Dr. Beard, and those others were generally of the greater importance. It was better also to look at the symptoms as a whole; to study the patient as a physiological unit, rather than investigate some particular symptom, which might be more curious than important. His experience agreed with Dr. Beard's in regard to the existence of functional derangement only in connection with these morbid fears.

Dr. Beard, in reply, said that he thought the great aim should be to discover the true pathological state of the patient. A study of the symptoms about which he had written helped very often in this direction, and was therefore valuable for diagnosis, prognosis, and treatment. These morbid fears were symptomatic of cerebraesthesia (brain exhaustion), and in a large proportion of the cases (but not in all) that cerebraesthesia originated in the genital organs—uterine displacement and disorders of the neck of the uterus—and diseases of the prostatic urethra in the male, from natural or unnatural excess.

Dr. Webster, of New York, by permission of the Society, related a case of morbid fear that had come under his notice. A woman 40 years old, had always from infancy been afraid of severe storms, high winds, thunder and lightning, and to those who were acquainted with her it seemed that she was insane at such times. When a storm arose at night, for instance, she would rouse the whole house and walk the floor in the greatest distress until it subsided. She did not suffer any pain, but only from nausea. He was told that her mother, while pregnant with her, had been severely frightened by a thunder-storm. The patient's condition was attributed by the friends to that fact.

Dr. Kinnicutt agreed with Drs. Beard and Seguin that morbid fears were evidences of only functional disturbance. In his experience they were very often associated with lithuria or oxaluria.

Dr. Spitzka.—I hold that the position of Dr. Rockwell is sound! Whatever relation fears, more or less akin to those

observed as natural manifestations in normal persons, may have to functional derangement, they are certainly highly characteristic of many organic cerebral affections. If Dr. Beard had frequently gone through the wards of an insane asylum, he would not have made the statement that morbid fears are never essential features of insanity. The Germans have a special term (*Kleinlichkeitswahn*) to designate a condition characterized by morbid fears and delusion of powerlessness; as it were, an antithesis to delusions of grandeur and power. The forms of fear described by Dr. Beard, are some of them of such a character that we would be justified in considering the subjects of them as being on the border-land of insanity. I have now under observation two cases of the fear of defilement, recently described by Dr. Hammond; they are both in one family, and I expect to show you a brother of them to-morrow, on which occasion the family history will be discussed. Suffice it to say both these subjects are epileptic.

Dr. Spitzka then related the following case of

REMARKABLE SYMPATHETIC DISTURBANCE.

I regret not having been present when the interesting case of Dr. Bannister was related, as I have seen an instance of mental alienation in association with a sympathetic tropho-neurosis several years ago myself. While visiting the asylum at Ward's Island, in 1876, the year in which I made the autopsies there, I observed a young man of twenty years of age, whose hair on one side was quite grey, while there were sharply marked and intensely colored yellowish brown patches on the same half of his face. On directing Dr. Kiernan's attention to the case he collected for me the following data in regard to him: The patient had been an habitual masturbator for many years. On one occasion, while indulging in his propensity he heard a loud sound as if a pistol shot had gone off in his head, and on the *left side*. He then felt hot on that side, according to his story, and three weeks or a month later, a large carbuncle, as he termed it, opened on the left side of his neck. He was transferred to the asylum in a state of deep depression, and his left pupil was observed to be contracted at the time by Dr. Kiernan. He improved some-

what as to his melancholy, and developed an excessive self-esteem, more, however, in the way of the ostentatiously displayed self-importance of pubescent insanity than of delusions of grandeur. With this the patient was occasionally but mildly excited. The cicatrix of the "carbuncle" is situated on the left side and a little behind the third cervical vertebra. When I saw him there was decidedly an asymmetry of the face, the left side being atrophic; but I observed nothing further about the pupil than that the left one moved more sluggishly than the right. He was at this time very shy and hypochondriacal, especially as to the condition of his hair, which remained grey for two years, although less so at the end of that time. He had spells of taciturnity, but at other times was in a fair mental condition, and at his own request was put at some clerical work.

I am informed that at the discussion the relation of progressive paralytic insanity to lesions of the sympathetic was referred to. Now, although there is good authority for such a connection, and although I myself believe paralytic insanity to be associated with marked vaso-motor disorder, yet, for the reason that the cerebral vaso-motor centre is after all encephalic, and further, as injuries and degenerations of the sympathetic are only exceptionally followed by insanity of any form (never to my knowledge by paresis), I consider the inference faulty. The researches of Poincaré and Bonnet, supporting that theory, have not been confirmed, and as to my own researches on the pathology of paresis, I have found the degeneration of the sympathetic ganglion present only when the cord was intensely degenerated. I have found it absent where the cord was slightly or not all involved. No importance can be attached to the lesion of the sympathetic therefore, the essential lesion is cerebral.

In other cases of gun-shot injury of the sympathetic, notably in one reported by an Austrian surgeon during the campaign of 1866, no mental symptoms whatever have been observed.

In a short discussion which followed, Dr. Spitzka referred to the fact that experiments and investigations showed the sympathetic system to be independent of mental disturbances,

and that it could be greatly injured or diseased, and yet the mind not be at all affected.

The Society then adjourned to meet Thursday, at 2.30 p. m.

THURSDAY, JUNE 19TH.—SECOND DAY—AFTERNOON SESSION.

The Association was called to order at 2.30 p. m. by the President.

Present—Drs. Beard, Edes, Gray, Hammond, Kinnicutt, Mason, Miles, Morton, Putnam, Rockwell, Schmidt, Seguin, Shaw, Spitzka, and Van Bibber.

The minutes of the previous day were read and approved.

The Council reported that it had examined the papers presented by the two candidates for membership, and recommended that they be elected members by the Association.

On motion, the By-Laws were suspended, and the Secretary was then instructed, by motion, to cast an affirmative ballot for Drs. W. J. Morton and R. W. Amidon, of New York.

The amendment to the By-Laws, offered yesterday by Dr. Gray, was adopted by the Association.

Dr. Hammond offered an additional amendment, as follows : "The presentation of a written neurological communication shall be deemed a valid excuse for absence from an annual meeting of the Association." Adopted.

The President announced the following Committee on Nominations: Dr. H. D. Schmidt, of New Orleans; Dr. E. C. Spitzka, of New York; Dr. A. D. Rockwell, of New York; Dr. J. J. Putnam, of Boston; and Dr. J. C. Shaw, of Brooklyn.

Dr. Rockwell presented two cases: I present these two cases because they illustrate two very important points in therapeutics: 1st, The necessity for, and the good results that come from perseverance in seemingly hopeless cases of infantile paralysis. 2d, A suggestion in regard to the differential indications for the use of galvanism and faradism in the relief of pain. This little boy, aged four, sent to me by Dr. McElroy, of Mott Haven, suffered in 1877 from a severe attack of chills and fever, followed by convulsive seizures. Complete paralysis followed, and six months subsequently, after the leg

had become cold and atrophied to the last degree, with entire loss of both farado- and galvano-muscular contractility, I first saw the child. It was not until after six weeks of treatment that there was the slightest evidence of returning galvano-muscular contractility, and six months of persistent effort followed before there was any response to the faradic current. At the present time the contractions are good—the limb warm and nearly as large as its fellow, and, with the aid of a chair, the little one can move around quite readily.

In consideration of the absolute and long-continued paralysis and loss of electric response to either current, the results have impressed me deeply, and should teach that no case of infantile paralysis should be hastily abandoned to its fate, even though it seem possible, as in this case, that commencing fatty degeneration existed.

The second point is illustrated in the case of this gentleman, sent to me by Dr. Malcolm McLean, of Harlem: Last Christmas, without knowledge of special exposure, but subsequent to much mental depression for cause, the patient began to suffer from extreme pain in the back and along the sciatic nerve. The pain was dull and aching, with occasional sharp twinges. At times he was quite helpless. He was treated in many ways—even by cauterization—without experiencing any relief, and latterly he has been worse. I first saw the patient two weeks ago (six months since the first attack) and although well aware of the probable indications for treatment, but in order to test the case thoroughly, I made a careful labile application of the galvanic current, which served to increase the pain. Two days after I resorted to faradization, placing the sound as well as the lame foot on the negative pole, using an exceedingly fine current, carefully avoiding all motor points and carefully refraining from producing appreciable muscular contractions.

The patient has been thus treated but three times, and as you will observe, is nearly well. The points of this case that I wish particularly to emphasize, are first, that in differentiating between the use of the two currents for the relief of pain, the effects of pressure are most useful guides, and that while true neuralgia, as defined by Anstie, and pain generally yield

as a rule more readily to the galvanic than to the faradic current, the latter is in some cases, not only invaluable, but relieves, where galvanism is worse than useless, since it serves only to exaggerate the existing distress. This case is a good example of this statement, for on my first examination, I found that firm and prolonged pressure did not increase the pain, but afforded relief. Slight pressure, on the contrary, caused, all along the outer aspect of the thigh, very intense pain. Hysterical neuralgias, and the so-called pseudo-neuralgias, which are simply forms of pain, occupying certain areas, and running seemingly in the direction of certain nerves, undoubtedly indicate the faradic current. In these cases it is well known that firm pressure tends to relieve, while light touches aggravate the distress.

With reference to the case of infantile paralysis, Dr. Miles asked if voluntary movements had returned to the muscles.

Dr. Rockwell replied that they had; that they were marked, and that they had returned after an absence of six months, after all normal recovery had taken place.

Dr. Miles remarked that he had succeeded in such cases in restoring galvano-muscular contractility, but not voluntary action.

Dr. L. C. Gray, of Brooklyn, asked which pole was used for the relief of pain.

Dr. Rockwell replied that he used the descending current.

Dr. Hammond remarked that he had reached the conclusion that it did not make any difference with regard to which pole was employed, and that the one was as good as the other.

Dr. Rockwell remarked that to reach correct conclusions upon this, as upon other interesting points, considerable observation was necessary. He had seen cases in which, after obtaining very good results from the use of the descending current, he had, in order to hasten the improvement, used the ascending current, and all the pain returned.

Dr. Hammond remarked that he had seen such a result from the continuous use of one current, either the ascending or descending.

Dr. Gray remarked that his experience had led him to the conclusion that it made but little difference which pole was

employed, except about the eye or face. Upon the face he had found a difference in the effect produced by using different poles, and he had explained the difference by the fact that in physiological experiments and therapeutical uses of electricity the conditions were essentially different; in the one the nerve was laid bare, while in the other it was more or less deeply covered with tissues. When deeply covered, the electricity became so diffused that its direct action upon the nerve was questionable, while in regions in which the nerves were less deeply covered the conditions present in physiological experiments were more closely approximated.

Dr. Gray then referred to a case of tic douloureux in which galvanism did good for the first day, and for the next two or three days it did harm. On the *first* day he used the descending current, or positive pole; and in the succeeding two or three days he employed the ascending current or negative pole. He at once returned to the use of the descending current, and so long as it was continued there was a great amelioration of symptoms.

Dr. Beard remarked that the most interesting feature of Dr. Rockwell's case was the fact that the faradic current gave relief to the pain. It had been stated for such forms of disease we must use the galvanic current exclusively. In the cases of sciatica reported by Dr. Gibney, of New York, that idea was involved, and it was a popular opinion in Europe at the present time; but it was erroneous.

The suggestion made by Dr. Rockwell with reference to pressure as an indicator in differentiation as to the use of galvanism or faradism to relieve pain, was perhaps a good general guide; but it was not applicable to all cases.

With regard to the direction of the current he thought it was one of the most difficult things in the world to differentiate, so that we could eliminate any source of error. For the present he had abandoned it. Theoretically there should be a difference in the action of the poles, and difference in direction of the current with regard to the poles; but practically, the elements of error were so that he confessed he was not always able to make the differentiation.

Dr. E. C. Seguin asked Dr. Beard if he recognized the polar

method in distinguishing electrical reaction. Dr. Beard replied that he did.

Dr. Seguin thought that settled the question, for by that method decided differences could be distinguished. If we proceeded to test the patient according to Erb's instructions, we obtained decided polar reactions and peculiarities, and those peculiarities which were normal were imitated in pathological conditions, and could be recognized in the first examination of a case of paralysis. With regard to relief of pain, his experience had been favorable to the sedative effects of the anode, provided a mild current was used, and to the exciting effect of the cathode.

Dr. Beard remarked that in a majority of cases pain was relieved when a sufficiently mild current was used. For the first four or five years of his practice he always knew what pole he employed, but of late years, in very many cases, he did *not* know, and he was not able to recognize any change in the results of his electrical treatment.

Dr. Putnam remarked, it was proper to say that perhaps we invoked the aid of physiological experiments too much, inasmuch as those effects were suddenly produced, and passed away as quickly.

Dr. W. J. Morton, of New York, remarked, he felt quite sure that, in neuralgia of the trigeminus the positive pole reduced pain in cases in which the negative pole produced no marked effect. He thought that the determination of the polar difference should not be lost sight of in electro-therapeutic treatment, and that the very fact of the existence of such a difference implied a corresponding difference in the therapeutic effect of the two currents. Nothing was better established than the peculiar catalytic action of the two poles upon the human tissues, at least in certain cases; the positive pole of a body battery applied to the open surface of an indolent ulcer would cause it to granulate and heal in a few days, while the negative, applied at the same time, on the sound parts, produced a destruction of tissue in the shape of small pustules, which would become ulcers. He had been accustomed to consider the positive pole as consolidating, organizing and sedative to the part applied, and the negative as liquefying, disorgan-

izing and destructive; this, at least, he felt sure was the effect in the treatment of ulcers by galvanic electricity, and there was no apparent reason why the same catalytic effect should not hold true of the electrodes of the galvanic battery whenever applied to any tissue. It was fair to presume that the special effect inherent in the nature of the poles should extend itself to a certain extent in the line of the tissue circuit connecting the two; and on the ground also of the catalytic difference in the two poles, he should be unwilling to think that it made no difference in which direction the current was applied.

Dr. Gray thought there could be no question but that there was a physiological difference between the poles, but he failed to see that there was convincing evidence to prove any therapeutical difference. He then referred to a book published last year by L. J. Teissier, of Paris, in which the author had manifestly taken considerable trouble to collect evidence with reference to the therapeutical value of electricity, but in looking through it he had failed to see any convincing evidence to prove any therapeutical distinction between the poles. He (Dr. G.) did not say there was no difference, but he simply believed that it had not been proven.

Dr. Hammond thought Dr. Gray would change his opinion when he witnessed the result of electrical treatment of ulcers.

Dr. Gray remarked that he had used electricity in the treatment of abscess, and that he had not seen any difference in the results obtained by the use of different poles.

Dr. Hammond remarked that he knew there was a therapeutical difference between the positive and the negative poles, and that fact he first established to his own satisfaction in a series of cases of ulcers treated by galvanism at the Baltimore Infirmary several years ago. He knew that a silver (*positive*) plate placed upon an indolent ulcer, with a zinc plate (negative) above facilitated healing; whereas, applied in the opposite manner, the condition was invariably aggravated. The single pair of plates gave the least possible intensity.

Dr. Gray remarked that he did not question the difference in the results in the treatment of ulcers; but he should not, from that fact, argue with regard to the therapeutical value upon the unbroken skin.

Dr. Hammond remarked that he was aware it required a great deal of experience to settle some of these difficult questions in electro-therapeutics. In his opinion it did not make any difference which current was used to give relief to pain. We already knew that there was a physiological and a chemical difference between the action of the poles, and the question then was whether there was any therapeutical difference, and he thought there was.

Dr. Beard thought there was no chance for dispute with regard to the effects produced upon ulcers by different poles, the positive being the more efficacious for healing purposes. He believed there was one thing sure—namely, that in all countries where electricity was used, there was less and less tendency to insist upon polar use. The best writers took the view that the practical difference between the positive and negative pole was not so much as formerly supposed.

Dr. Gray remarked that he did not believe there was any difference with regard to the direction of the current; and that if there was a difference it was between the poles.

Dr. Miles remarked that he had seen unmistakable difference between the two poles in allaying pain. In the treatment of myalgia occurring in his own person, he had found that the positive pole gave relief much sooner than the negative.

INFANTILE ENCEPHALITIS FOLLOWED BY ATHETOTIC SYMPTOMS.

Dr. E. C. Spitzka exhibited a patient who had athetotic symptoms, as he believed, the result of infantile encephalitis.

GLOSSO-LABIO-LARYNGEAL PARALYSIS.

Dr. Hammond presented a patient suffering from the above disease. The treatment was, phosphide of zinc, one-tenth of a grain, t. i. d., and extract of nux vomica, one-third of a grain, t. i. d. Electricity was also used; and, while the patient was certain that he was improving, Dr. Hammond thought his condition would never be substantially improved.

MYELITIS WITH FORMATION OF CAVITIES OR VACUOLES IN GANGLION CELLS IN ANTERIOR HORNS OF SPINAL CORD.

Dr. R. T. Edes, of Boston, read a paper in which was given the clinical history of a case that developed, orderly and symmetrically, symptoms referable to the spinal cord. There

was symmetrical atrophy of the legs below the knees, and the arms below the elbows, and the left pupil was larger than the right. The case was of a little less than four months' duration, and on microscopic examination of the cord the white substance was found normal in every respect. In the grey matter the only change consisted in the presence of large polygonal spaces or vacuoles in varying numbers in the anterior horns. The processes of the ganglion cells seemed slightly changed in places—shrunk and shortened. The lesion was found in the cervical enlargement, in the dorsal region, and in the lumbar enlargement. The specimens seemed to illustrate that parenchymatous changes might take place independent of blood-vessels or neuroglia.

Dr. Putnam remarked that he had seen a case closely resembling Dr. Edes' in clinical history, except that the fever was higher, the temperature rising as high as 104°–105° F. There was the same progressive paralysis, and, on microscopic examination, spots of softening were found in the lenticular ganglion upon the left side. In the cervical region there was an evident change in the ganglion cells, consisting in large collections of fat. He thought that it was possible, if the case had lasted longer, the change might have gone on to the formation of vacuoles.

Dr. E. C. Seguin referred to specimens in his possession, of acute myelitis, in which the symptoms of transverse and total myelitis were developed within twenty-four hours. Death occurred at the end of the sixth or seventh week, and on examination he found extensive softening of the lower dorsal cord, which microscopically exhibited no special lesion, but in sections below, the first of moderate worth, there were found vacuoles, such as described by Dr. Edes.

He thought the clinical history of Dr. Edes' case belonged to poliomyelitis more nearly than anything else.

Dr. Edes remarked, that although his attention was for the first time called to the change present in his specimens, he looked through many sections of other spinal cords which he had, and in a single section he found one cell of the kind described, and in a case which was recorded as healthy. He now thought it was a cord not above suspicion.

Dr. H. D. Schmidt, of New Orleans, remarked that he had observed vacuoles in the colored blood corpuscles, and the only way in which he could explain their presence was that a portion of the protoplasm had decomposed. He had frequently seen the same appearance in the sympathetic system, between the ganglionic body and the protoplasmic portion of the processes. In that case he had ascribed it to contraction of the protoplasm and filling of the space thus produced between the enclosing membrane and the body by some liquid or gas. Dr. Schmidt thought that the vacuoles seen in Dr. Edes' specimens were fat globules; for, in some of the ganglionic cells there could be seen granular degeneration, which needed to be only a little more marked to become fatty infiltration.

Dr. Spitzka regarded the use of alcohol as prejudicial against the proper preservation of nerve tissue, in that it favored the formation of crystals of leucin and other like substances. Even where chromic acid was used, he had found little spore-like bodies, which presented the appearance of myelin, but which were not myelin.

Dr. Edes remarked that he had compared his specimens with many others made in the same manner, and did not think the method of preparation and preservation of the tissue had anything to do with the change exhibited. Furthermore, the symmetrical distribution of the lesion, together with the symmetrical character of the symptoms pointed to a very close relationship with each other.

Dr. Schmidt did not think they were artificial, because there were but few cells involved; there were many cells around them which were not at all affected.

Dr. Spitzka.—While I do not mean to intimate that the lesions in Dr. Edes' case are anything but genuine, I consider it unfortunate in any case of disease involving the nerve centres, to use alcohol, as it produces many curious appearances, even in the freshest and healthiest brains. I should like to ask if the cranial nerve nuclei were examined, and whether any lesions were found in them?

Dr. Edes.—They were examined and no lesions found.

Dr. Spitzka.—Then this would be one of those cases in

which, on the borders of an actual lesion, the lesions one would expect to find, as in this case, for example, those determining the facial symptoms, were impalpable?

Dr. J. C. Shaw.—In examining these specimens, I see that there is a perceptible sclerosis of the lateral columns. This is of interest to me, as I have recently published a case of progressive muscular atrophy with bulbar paralysis, in which there was myelitis of the anterior horns with sclerosis of the lateral columns, but without contraction. Now this case of Dr. Edes, it appears to me, has some bearing upon the cases described by Prof. Charcot as lateral amyotrophic sclerosis, and it would appear that sclerosis of the lateral columns due to myelitis of the anterior horns is not an uncommon condition. This case is of double interest, as it has lasted only six weeks.

Dr. Spitzka.—There certainly is lateral sclerosis of a limited extent here.

The Secretary read a communication from Dr. J. S. Jewell, of Chicago, expressing his regret at not being able to be present because of serious sickness in his family.

Dr. J. J. Mason exhibited micro-photographs illustrating

THE HISTOLOGY OF THE MEDULLA OF THE ALLIGATOR.

Two years ago I had the pleasure of exhibiting to this Association sections of various portions of the central nervous system of the alligator. During the winter of 1877 and '78, following, a residence of several months in Florida enabled me to continue the study of the subject, with abundant material. It was then my purpose to prepare an exhaustive treatise; but, before the text could be written, the first part of Rabl-Rückhart's article appeared in the *Zeitschrift fuer Zoologie*, January, 1878.

His researches had their source in the accidental and, to me, untimely death of five large Mississippi alligators at the Berlin aquarium in the winter of 1875 and '76. So far, he has not published any of his microscopic work, all of it being reserved for part II.

While, therefore, we can no longer enjoy a monopoly in the study of the nervous system of this species of American reptiles, let us hope that the audacity of our transatlantic col-

league, in thus superseding us on our own ground, may tend to awaken a larger degree of patriotism in our scientific work.

I wish, to day, to call the attention of the Association to some peculiarities of structure which are to be found in the medulla oblongata and spinal cord of this alligator, illustrated by sections and photo-micrographs, and to show a few sections of the medulla oblongata of the skink lizard (*Scincus quinelineatus*, Holbrook), the gopher turtle (*Testudo polyphemus*) and the bullfrog (*Rana pipiens*). At our next meeting I hope to be able to present a more complete collection of photographs, illustrating as fully as possible all the most important features of the subject. The photographs will be permanent, printed by the new process of Bierstadt, called the artotype.

The sections on the table show, first, a group of remarkably large nucleated multipolar cells situated within the septum of the medulla oblongata. These bodies send out long processes; and, in one of the sections, a process appears to enter another septum at a considerable distance from the first. They are found chiefly in sections made just behind the point of exit of the acoustic nerves. Their size is often double that of other cells in the medulla, and of any that I have yet seen in the spinal cord. They are found in even larger numbers—though of relatively smaller size—in the same region of the medulla of the skink, extending well towards the cervical region, but are absent (as a group, at least) in the medulla of land turtles and frogs. Stieda does not mention nor figure them in his work on the structure of the nervous system of the turtle (*Testudo græca*), but in the same monograph, part I., on the nervous system of the axolotl, page 17, says: "In the spinal cord a cell-grouping exists on either side—especially in the inferior horn; in the median line no cells are to be noticed; here in the medulla oblongata nerve cells lie on the whole periphery of the grey matter, and *also* in the median line. At about the middle of the medulla oblongata the cells begin to show themselves, and can be followed farther in successive sections. As regards the appearance of the nerve cells in general, they are of the same form and size as in the spinal cord, while in the anterior portion of the medulla

oblongata I find—especially in the median line, or in its immediate vicinity—remarkably large cells, with long processes.” These cells may, and probably do, correspond with those which I have found in the alligator and skink, for they were found near the acoustic nerve, although the body of the cell is represented in the cut as lying outside, while its processes alone are within the septum. As shown by my photograph, in the alligator, the cell body itself is imbedded in the muscles of the septum.

Second: An arrangement of spindle-shaped cells in the inferior horns of both the cervical and lumbar enlargements of the spinal cord. This arrangement relates to the processes which run parallel with each other towards the superior horn, describing a series of curves with their convexities towards the central canal. It is also seen in the turtle, first, I believe, by Lockhart Clark.

Third: The thickness of the cord of the alligator, in different regions, is well shown by photographs 3 to 6, inclusive.

The negatives were taken through the same objective, so that we have only to measure the photographs to obtain a sufficiently correct estimate. These measurements are as follows for cervical and lumbar enlargements:

Cervical—horizontal	$4\frac{1}{16}$ inches.
“ vertical	$2\frac{5}{8}$ “
Lumbar —horizontal	$4\frac{2}{16}$ “
“ vertical	$2\frac{7}{8}$ “

The grey matter of the lumbar enlargement on a cross-section exceeds but slightly in amount that of the cervical enlargement (*when measured*), so that in reality there is little or no difference between the dimensions of the cord in these two regions. Such an equality in thickness does not exist in the cords of animals destitute of a tail, or in those with whom it is merely an appendage. The apex of the inferior horn is, as a rule, broader and more angular in contour in the cervical than in the lumbar enlargement; and this feature, together with the existence here of two distinct groups of cells, as in the cord of the frog, enables us to distinguish under the microscope between two preparations made from the two different regions.

The sections from the cord of the Florida gopher are of interest, as showing the same general conformation of the grey matter as was observed by Stieda in *Testudo græca*, with the exception of the dorsal region, when the inferior horns appear nearly straight.

Dr. Spitzka.—The groups of cells shown by Dr. Mason are peculiar for their size, and I know of no other animal in which the raphe cells reach these dimensions; it is certainly an interesting observation in every way. I have observed cells in the raphe of lesser dimensions; in man, where they occur in large numbers, sometimes in the altitude of the hypoglossal nuclei, as well as in the yellow spotted and snapping turtle, and the Pseudopus. I consider their occurrence in the medulla oblongata as due to a local modification of the embryonic laws of growth, which condition does not obtain in the cord. I hold these cells to be auxiliary to the cranial nerve nuclei.

(In response to Dr. Mason's theory as to their relation to the length of the tail.)

Dr. Spitzka.—I do not think that these cells can have a special relation to the size of the tail; the raphe would be a very unfavorable place for the location of such cells, since its fibres cross the nerve-axis. Furthermore, I do not believe in such distant projection from grey matter of the third category. If these cells be analogous to the similarly situated cells of the chelonia, then a single instance would contradict it. The yellow spotted turtle, with a short, weak tail, has this group twice as large as the snapping turtle, with its tail as muscular almost as the alligator's, and as long in the male as the entire shell.

(Dr. Mason stated that it was only an informal suggestion, and not even a theory with him.)

Dr. Schmidt.—Regarding Dr. Mason's specimens, I asked to what group of ganglion cells he supposed the ganglion cells of the raphe, which he exhibited, belonged, and whether they might not be analogous to the nuclei of the stratum zonale, or be compared with those ganglion cells in the white columns of the spinal marrow of the amphiuma?

The Society adjourned to meet at 8.30 p. m.

SECOND DAY—EVENING SESSION.

The Association was called to order by the President.

Present: Drs. Amidon, Beard, Hammond, Kinnicutt, Mason, Miles, Morton, Rockwell, Seguin, Spitzka and Van Bibber.

The proceedings began with remarks by Dr. Wm. A. Hammond, of New York, on

METALLO-THERAPY.

He referred to its history, spoke of his own work in connection with the subject, and expressed his great surprise that a man of such scientific training and experience as Charcot should have lent himself to so vile a humbug. Dr. Hammond showed disks of various metals which he had used in his experiments, and asserted that the one of tortoise-shell was the most efficacious, and was the one used most.

The subsequent discussion of the matter showed it to be the unanimous feeling of the Society that the claims of metallo-therapy were unfounded and absurd.

In view, however, of the fact that it was not yet universally condemned by physicians, and even had the support of some eminent men, it was voted that a committee be appointed to investigate the matter, both in its medical and psychological phases.

Dr. W. J. Morton, of New York, then read a paper upon the

TOXIC EFFECTS OF TEA.

The subject, he said, was best studied by examining that class of men, such as tea-tasters, who habitually took tea in large amounts. It was, however, not easy to obtain extensive data concerning those men, for they feared if the facts became known it might injure their business. Five cases, however, had been collected, and those, together with experiments performed by the writer upon himself, formed the basis of the paper.

The bad effects of tea-tasting were known and recognized by the tea-tasters themselves, and few could carry on the business many years without breaking down. One tea-taster estimated that he got about half a pound of tea into his sys-

tem during a day. It has been said that the symptoms from which tea-tasters suffered were due to alcohol or dyspepsia, but the facts collected showed the contrary.

The writer then gave the history of the cases referred to, and of the experiments upon himself.

The following is a *resumé*: First, as to the immediate effects of moderate doses, there was in the cases observed: an elevation of pulse, increase of respiration, agreeable exhilaration of mind and body, a feeling of contentment and placidity, an increase of intellectual and physical vigor, with no noticeable reaction.

The immediate effects of an excessive dose were: rapid elevation of pulse, marked increase of respiration to the extent of about one-third, increase of temperature, no period of exhilaration, but immediate and severe headache, dimness of vision, ringing in the ears, dullness and confusion of ideas. Following that was a severe reaction: exhaustion of mind and body, tremulousness and "nervousness," and dread of impending harm, that could not be relieved by taking more tea.

The effects of continued doses were a continuance of the tremulousness, extreme susceptibility to outside impressions, constipation, diminution of urine, and marked influence on the metamorphosis of tissue as shown by the diminution in the amount of urea. Thus, in the week during which the writer was taking toxic doses of tea, the amount of urine fell from f. $\frac{3}{4}$ xl. to f. $\frac{3}{4}$ xxxii. per day; and in the same time the urea fell from gr. 591 to gr. 422 per day. The sulphates, phosphates and chlorides were increased.

The results, as regarded the diminution of urea, agreed with previous experiments, but showed the influence of the tea much more strikingly.

From the study of the drug's action, Dr. Morton arrived at the following conclusions:

1. That with it, as with any other potent drug, there was a proper and an improper use of it.
2. That in moderation it was a mild and pleasant stimulant, followed by no harmful reaction.
3. Its continued and immoderate use led to a very serious

group of symptoms, such as headache, vertigo, ringing in the ears, tremulousness, "nervousness," exhaustion of mind and body, with disinclination to mental and physical exertion, increased and irregular action of the heart, and dyspepsia.

4. The mental symptoms were not to be attributed to dyspepsia.

5. It diminished the amount of urine, and retarded the metamorphosis of tissue.

6. Many of the symptoms of immoderate tea-drinking were such as might occur without a suspicion of the real cause.

The paper being open for discussion, Dr. J. J. Putnam, of Boston, asked whether the symptoms of weakness, nervousness, etc., which followed the taking of large doses, were those of reaction, or were the continued toxic effects of the drug.

Dr. Morton thought they were the latter.

Dr. Hammond referred to a case of his where the patient suffered intensely from neuralgia, brought on, he believed, by tea-drinking.

Dr. Miles asked if the tea-tasters were subject to any great mental strain or anxiety in their business.

Dr. Morton said that they were not. Referring to the influence of alcohol, he asserted positively his belief that it had nothing to do with the train of symptoms he had given. There was, to be sure, very often a craving for alcohol, but it was not uniformly felt, and the danger of drinking was appreciated by the tea-tasters.

The Association then adjourned to meet on Friday at 2:30 p. m.

FRIDAY, JUNE 20TH.—THIRD DAY—AFTERNOON SESSION.

The Society was called to order at 2:30 p. m. by the President.

Present: Drs. Amidon, Beard, Edes, Gray, Hammond, Kinnicutt, Miles, Morton, Rockwell, Seguin, Schmidt, Spitzka, and Van Bibber.

The minutes of the previous day were read and approved.

REPORT OF COMMITTEE ON NOMINATIONS.

The Committee on Nominations made the following report:

For President—F. T. Miles, M.D., of Baltimore, Md.

For Vice-President—R. T. Edes, M.D., of Boston, Mass.

For Secretary and Treasurer—E. C. Seguin, M.D., of New York.

For Councillors—Dr. F. K. Kinnicutt, of New York, and Dr. L. C. Gray, of Brooklyn, N. Y.

An election by ballot was held, and these gentlemen declared duly elected by the President.

Dr. Geo. M. Beard presented two patients who illustrated anthropophobia and topophobia. Both were strong, vigorous men.

THE DOSAGE OF ELECTRICITY.

Dr. Geo. M. Beard read a paper on the above subject, in which he stated that the dosage of electricity was a complex result of a number of different factors.

1. The strength of the current.
2. The length of the application.
3. The quality of the application, and
4. The method of the application.

1. The strength of the current.—It was difficult to estimate that, and to say that we had treated a patient with so many cells was saying but little. The size of the electrodes, the manner of their application, and the moisture of the skin, must all be taken into consideration. The resistance offered by the skin was also an important element, for it was variable, and, besides, the quality and temperature of the water were important considerations in making an estimate.

The amount of electricity passing through the body was varied by—

- a. The electro-motive force of the battery.
- b. The internal resistance within the battery; and
- c. The external resistance outside of the battery.

2. The length of the application could not be determined with minute precision. As a rule, European neurologists made shorter applications than did the American. There was no question but that long applications exhausted muscles, and an application of one or two minutes' duration to a paralyzed muscle was all that was beneficial. The beginning of electrical treatment should be with short applications and mild currents.

No absolute rules could be given regarding strength of current or length of application. Other things being equal, a stronger current required shorter applications. Other things being the same, the galvanic current was not so well borne for a long time as the faradic current of corresponding strength.

3. The quality of the application.—The use of mild currents at first was wise. Experience compelled us to admit that stimulating as well as sedative effects could be obtained by negative as well as positive poles. Practically, the difference between the positive and the negative poles, and between the ascending and the descending currents, was one of degree rather than kind.

4. The method of application was largely included in what had been said. He had long ago recommended the terms, medium, mild and strong currents as the best approximation possible to a fair description of the doses of electricity.

Again, the dosage of electricity was modified by the external position of the poles. The same strength of current with the negative pole was a stronger application of electricity than with the positive pole in the same locality.

Even the best constructed galvanometers interposed in the circuit could not be an accurate measure of the dosage of electricity, for the reason that the amount of electricity passing through the body of the patient would vary with the pressure on the sponge and with the position of the electrodes. Consequently there might, in different applications, be the same number of degrees indicated by the galvanometer, while the applications really were very different in their character and in their effects, because the electrodes were differently placed.

Temperament was another element to be taken into consideration in regulating the dosage of electricity.

Finally, what was true of familiar drugs, and the conditions regulating their dose, was true of electricity.

DISCUSSION.

Dr. A. D. Rockwell—There are probably few remedies to the effect of which there is such a varying degree of susceptibility as to electricity. There is no absolute law by which we

can be governed; and, therefore, each case must be studied by itself. Let the first applications be tentative: for until the patient has been submitted to a thorough electrical test, it will be impossible to decide the exact strength of current best suited to the case in hand. My own experience teaches, that where we aim to secure the tonic effects of electricity, or to relieve pain, the applications should never be carried to the point of inducing discomfort.

Very frequently, however, in the treatment of paralyzed muscles, this will not hold, and it becomes necessary to use a current strength that is not at all agreeable. When it becomes necessary to measure the galvanic current with some degree of accuracy, a properly constructed galvanometer is a useful accessory. I do not refer to the ordinary short coil galvanoscopes. These are so delicate that the needle is deflected to 90° under the influence of two or three cells, and are of service only when we wish to know whether a current is present, and if so, what is its direction. I have for a number of years used in my office a galvanometer, constructed at my suggestion, which has answered my purpose admirably well. It is of the long coil variety; is provided with a shunt, giving a resistance equivalent to 150 miles of telegraph wire. A freshly-charged zinc carbon battery deflects the needle about one degree for every cell. As the battery becomes weaker, it becomes necessary to increase the number of cells to deflect the needle a certain number of degrees; this deflection indicates approximately the strength the current cells should be increased. Of course the usual coils were so delicate that they were of no practical value except to show the presence of a current, and determine the presence of the positive and negative pole.

With regard to the direction of the current, he felt able to say from an experience in several thousands of cases, that for the relief of pain, the descending was much to be preferred to the ascending current. Whether it depended upon the direction of the current or upon polar action, he was not prepared to say. In a number of instances of true neuralgia, in which the descending current had relieved, a reversal of the method had again increased the pain.

With reference to general faradization, he could only account for the neglect of that method on the ground of great inconvenience to which the patient was subjected in the application; also the time required, together with the experience actually necessary to its satisfactory use.

Dr. L. C. Gray, of Brooklyn, remarked with regard to the therapeutic effects of general faradization, that he had had several cases which had made him a rather firm believer in its good effects for certain patients. He then referred to a case in which a lady suffered from symptoms upon which only a general diagnosis could be based. She had a feeble pulse, general physical weakness, chronic stomatitis and a variety of symptoms; and nothing which she had tried seemed to do her any good. He resorted to general faradization. After six sittings her stomatitis was cured; her appetite was better than it had been for a long time; her pulse was remarkably stronger, and she was able to walk very well. He had had a number of other cases in which the permanent effects of general faradization had been distinctly marked. The manner in which he applied it, was to have the patient place one foot upon a small sponge, and hold a sponge electrode in the opposite hand, and shifting them from one side of the body to the other. In his cases, that method had been sufficient, and was so simple that it gave no inconvenience to the patient.

Dr. Rockwell protested against the method described by Dr. Gray as a substitute for general faradization, because it would do more damage than good. Nothing partial could be with benefit substituted for general faradization.

Dr. Gray remarked, with reference to Dr. Rockwell's criticism of his method of application, that the "proof of the pudding is in the eating." What patients wished was to be cured, and, of course, it was no matter whether they were cured according to the rules of science or any other way which they chose to accept. The changes for the better were indisputable in his cases, and they were remarkable; and that fact was rather good proof of the lack of injury in the departure from the method formerly advocated.

Dr. Hammond asked Dr. Gray what class of cases he cured

by having the patient hold a pole first in one hand and then in the other.

Dr. Gray replied, that they were just such cases as he was now attending, one of which was sent to him by Dr. Hammond. In that case the patient had chronic rheumatism, a morbid, regurgitant murmur, and general debility.

Dr. Hammond.—And spasm of the sterno-cleido mastoid muscle?

Dr. Gray.—Yes; and that is steadily getting better.

Dr. Hammond remarked, that probably the spasm of the muscle would get well of itself. He doubted whether a case in which the disease was limited in its manifestations to spasm of the sterno-cleido mastoid muscle could be cured by changing the electric poles from one hand to the other. If it could be limited in that manner, he could give up general faradization altogether.

Dr. Gray remarked, he did not claim that the electricity was all the treatment which the patient received, for he had used subcutaneous injections of atropia.

Dr. Hammond, in confirmation of Dr. Beard's statement regarding the relative insensibility of the cervix uteri, stated that many years ago he had constructed an instrument with which the cervix could be galvanized for the purpose of establishing menstruation in certain cases. It consisted of a double spoon, the outer part being made of hard rubber, and the inner was metallic. By that instrument the cervix could be grasped between two metallic surfaces, and held firmly by means of a sliding ring. The instrument terminated in two wires, which were connected with the poles of a battery. In all cases where the current was passed through the cervix the patient was absolutely insensible of its passage. The same thing was true not only of the neck of the womb, but of the male urethra. When one pole was placed in the urethra and the other held in the hand, or placed upon the back or upon the pubis, the patient would not feel the internal pole until considerable current was felt in the hand or other part, and then only very slightly. He had another apparatus constructed, which was essentially a catheter that terminated in two metallic disks, so that both poles could be introduced into

the urethra. By revolving the instrument, it could be made to touch any part of the urethra, and even then the patient was not sensible of the passage of the current. But that did not hold good with reference to the galvanic current.

Dr. Beard remarked that it made a difference with regard to the size of the electrodes used. With the ordinary sound in the male urethra, a rather strong galvanic current could be used without producing pain, and it would be felt quicker than the faradic current. The general statement he had made was correct. But there was this distinction, that the faradic current was felt more with each portion of a minute than the galvanic current. That was well known by all. It was a fact that tonic and sedative effects of electricity could be obtained in the manner which Dr. Gray had mentioned, but it was not a method that should be recommended. He had no doubt that considerable tonic influence upon the body could be obtained in that manner, but it was absurd to adopt it when it was possible to use any other method.

Dr. Gray asked Dr. Beard what his method of using general faradization was?

Dr. Beard replied that it varied very much indeed. Practically undressing was a minor trouble, and it was the method he usually adopted. In some cases only the shoes and stockings were removed, but it was necessary to raise the clothes so that the electrode could be carried over various parts of the body.

Dr. Gray remarked that the amount of electricity made to pass through the system in that manner was about the same as by his unscientific method. With the sponge under one foot and the electrode in the opposite hand, the current passed through the foot, the limb, traversed the cavity of the body, traversed the tissues of the body, and came out at the palm of the hand, and by reversing the procedure, the current was made to pass through the tissues in an opposite direction. The only parts which were not collaterally affected were the neck and the brain, and they might be affected by allowing the patient to take one electrode in the hand while the other was passed over those regions.

Dr. Rockwell remarked that the effect of electricity was

manifested when recomposition of the current took place. The body conducted electricity by virtue of its saline solutions. The skin was a bad conductor of electricity, and only when it was well moistened would it readily conduct. Therefore, placing one pole on the posterior portion of the body and the other in the anterior, the electricity, after it penetrated the skin, naturally, all other things being equal, took the nearest course from pole to pole. The diffusion of electricity over a brass ball had been advanced as a parallel case, but in that instance, as was well known, the electricity diffused itself over the surface and did not penetrate into the interior. The cases were far from being parallel, not only upon the theory of the conductivity of the body, to which allusion had been made, but because actual physiological experiment showed that the electric current did penetrate to the interior of the body. By experiment with the rheoscopic frog, Erb had found that the galvanic current could be made to pass directly through the brain. Neither the interior of the body nor the muscular substance external could be affected to any great extent by holding one pole in the hand and placing the other under the foot. What he objected to in Dr. Gray's method was that it did not answer the purpose of general faradization, because an incomplete could not take the place of a complete method of application. Certainly fifteen or twenty cases would not substantiate its value as a substitute for a method which had gone through years of experimentation both in this country and in Europe.

Dr. Hammond asked either Dr. Beard or Dr. Rockwell, if by any process of general faradization we could act upon the viscera of the body by means of the faradic current? Could the faradic current be made to act upon the heart? Dr. Hammond thought it was not possible by the use of the strongest possible faradic current in general faradization to so affect the heart that its influence on the pulse could be recognized by either the finger or by the sphygmograph.

Dr. Rockwell thought it possible to affect the heart, and stated that Fothergill claimed that electricity acted upon the heart, as proven by an increase of the strength of the pulse.

Dr. Hammond.—That is indirectly through its general tonic effects.

Dr. Rockwell remarked that he was positive he had seen it affect the heart, time and time again, independent of the general tonic effect produced through it upon the great sympathetic and pneumogastric.

On motion, the discussion was postponed until the evening session.

PATHOLOGICAL LESIONS IN THE NERVOUS SYSTEM IN YELLOW FEVER.

Dr. H. D. Schmidt, of New Orleans, demonstrated microscopical specimens prepared from the brain and spinal cord of patients dying of yellow fever.*

CHOREA IN HYSTERICAL CHILDREN.

Dr. L. C. Gray, of Brooklyn, read a paper containing the histories of several cases in which chorea and hysteria co-existed in the same children: three girls and one boy.

DISCUSSION.

Dr. Hammond referred to a case in which the movements were similar to those seen in the boy presented by Dr. Gray, and which yielded completely to large doses of arsenic. The remedy was gradually increased until the patient took $\frac{1}{4}$ of a grain of arsenious acid daily. The patient remained in the city two months, and then returned to her home in Texas. This spring the choreic movements returned; she came back to New York; was being again treated in the same manner as before, and the twitchings were measurably diminishing. In addition to the arsenic, she was taking valerianate of zinc.

Since he had used large doses of arsenic, he had not seen a case of chorea that he would be willing to abandon, until he had produced the toxic effects of the drug. There was no external sign by which he could tell whether the patient could bear the remedy or not, but had not had any difficulty in using it.

He was now ready to take back the statement he had formerly made that chronic chorea was not much amenable to

* See, for a full account of Dr. Schmidt's researches upon the pathology of yellow fever, the *New York Medical Journal*, Feb., 1879, p. 113.

treatment. Chorea in adults, however, was almost an incurable disease.

In the use of arsenious acid, he began with $\frac{1}{40}$ of a grain, three times a day; or *four* drops of Fowler's solution to a child, three times a day, and then produced the toxic effects of the remedy as soon as possible.

Dr. Gray referred to cases in which he had commenced the arsenic treatment by the use of ten-drop doses, and he had found that, as a rule, those doses at once were well borne.

Dr. Rockwell suggested the use of electricity in such cases—general faradization—because the children were usually delicate, alternating it with the galvanic current applied to the parts affected. Some years ago Dr. Miller, of this city, sent him two cases—mother and child, suffering from choreic disturbances of the face. The mother's had existed her lifetime, and received no benefit from treatment. The child's symptoms had existed more than a year, but were entirely dissipated by treatment, which consisted in the use of electricity and the subcutaneous injection of eserine, in $\frac{1}{24}$ grain doses.

During last winter, he was called to see a younger brother, five years old, who was suffering in the same way. The first symptoms had been noticed several months previously. The same treatment was adopted, and was followed by prompt relief.

Dr. R. W. Amidon, of New York, then read an elaborate paper, entitled, "A Contribution to the Study of Cerebral Localization."

On motion, the discussion was postponed until the evening session.

The Association then adjourned to meet at 8:30 p. m.

THIRD DAY—EVENING SESSION.

The Society was called to order by the President.

Present: Amidon, Beard, Edes, Gray, Hammond, Miles, Putnam, Rockwell, Seguin, and Spitzka.

The President announced the committee on metallo-therapy: Drs. A. D. Rockwell and Wm. A. Hammond, of New York, Dr. J. C. Shaw, of Brooklyn, Dr. S. G. Webber, of Boston, Dr. J. S. Jewell, of Chicago, and Dr. Geo. Van Bibber, of Baltimore.

The discussion upon Dr. Amidon's paper on the "Localization of Cerebral Diseases," was continued.

Dr. E. C. Spitzka, of New York, remarked that the tendency had been for some time to localize lesions too closely, and he was pleased to notice that Dr. Amidon had appreciated the error of this method, and had recognized the anatomical variability of the brain.

Dr. Amidon remarked that in foetal life the brain was first a mere vesicle, with perfectly smooth external surface, with nerves running to it. It was probable that in this smooth surface motor centres were already established. When the fissures began to appear and the sulci to form by foldings in of this outer membrane, the centres might be carried by such foldings sometimes in one direction and sometimes in another. In this way the motor centres, for instance, might be brought either in front or behind, or even at the bottom of the fissure of Rolando. A motor centre, therefore, could not be invariably referred to a particular convolution, but must be indicated by a pretty large area of tissue.

Dr. Seguin remarked that for some time he had recognized this fact, and had been in the habit of indicating the various centres by rather large areas, which occasionally overlapped each other.

CEREBRAL HEMORRHAGE.

The President (Dr. Miles) then showed the brain of a person whose history was as follows: He had been suffering from Bright's disease, and was suddenly taken with right hemiplegia of arm and leg. When first seen by the speaker, immediately after the attack, his mind and speech were perfectly normal. He soon began to recover the use of his arm; and later, in three or four weeks, movement began to return to the leg. Before recovery was complete, however, the patient died. Post-mortem examination showed the existence of a small circumscribed clot, partially absorbed, in the left hemisphere at a point where a section passing through the anterior frontal convolution downward, not quite parallel with the fissure of Rolando, would cut into it. It was a region supposed to be motor. The case was particularly interesting, however, because the clot was very circumscribed; it did not involve the cortex,

but only the nerves running to the cortical motor centres, and there was no mental disturbance with it.

Dr. E. C. Seguin, of New York, related two cases showing abnormal sexual emotions, interesting chiefly in their psychological bearings. A female patient, perfectly well except for attacks of migraine, experienced occasionally the sexual orgasm while sleeping and dreaming; the dreams that excited the orgasm not being at all of an erotic character. On the contrary, the orgasm was generally excited by some emotion of great disappointment. At the climax of such disappointment the orgasm would be experienced. The other patient experienced the orgasm when she was greatly hurried in her dream. The cases showed an apparent violation of the law of association of ideas, and a variation from the ordinary way in which the orgasm was brought about.

Dr. Seguin also exhibited sections of a spinal cord in a case of myelitis, these sections showing the vacuoles, or dropsy cells, which had been referred to in previous discussions. The sections were made from just below the seat of greatest inflammation.

Dr. Spitzka related the case of a patient who had died from a cystic tumor at the base of the brain. The tumor was oval in shape and about the size of a small orange. Its exact nature could not be determined, but it probably originated from the dura mater. During its growth the patient gradually became blind, paralytic, and insane. Four distinguished neurologists had during life pronounced upon it four different diagnoses, not one of which was correct.

Dr. Spitzka read also the abstract of a more elaborate article upon

THE PEDUNCULAR TRACTS OF THE ANTHROPOID APES.

The object of the paper was to show the homologies that existed between these structures in man and the animals just below him. The field had not previously been worked up, and yet its study revealed greater evidence of structural affinities than the study of the hemispheres. The conclusions reached were, that the difference in those tracts between man and the anthropoids was less than that which often existed between the tracts in different men, and that there was in fact a

structural identity between man and the ape next below him. The discussion of the paper was postponed till the next meeting of the Association.

Dr. J. C. Shaw, of Brooklyn, read a paper upon

TENDON-REFLEX IN THE INSANE.

He had examined 130 insane paretics in reference to this symptom. Ten of these had general paralysis, in whom tendon-reflex in 3 was absent. All the cases had a certain ataxia of gait. In the early stages of the general paralysis he had never found the reflex abolished. In 15 other cases of dementia, etc., reflex was absent. Two or three of these were cases of senile insanity. In 29 of the remaining cases reflex was slight; in 76 it was normal.

The conclusion arrived at was, that if tendon-reflex was present in paretics, degeneration of the posterior columns might be excluded.

All were agreed that the tendon-reflex was a reflex phenomenon; and we should expect a lesion in the lower part of the cord of a patient in whom tendon-reflex was absent, showing such a lesion. Other specimens were shown, illustrating the idea that in chronic meningeo-myelitis the changes were apt to be more marked and more frequently seated in the posterior portion of the cord, in this way abolishing tendon-reflex.

Dr. Spitzka stated that he had at one time made an examination of 40 cases; and his examinations, so far as they went, tended, like those of Dr. Shaw, to show that the abolition of tendon-reflex was an indication of a lesion in the posterior columns of the cord.

The Association then adjourned, to meet on the third Wednesday in June, 1880, in the city of New York.